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April 3, 2003

Secretary of the Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Dear Secretary Dortch:

Enclosed are the following:

Original and four (4) copies of a Petition to Amend the Petition for Rule Making and Request for Notice of Inquiry which was filed on January 24, 2003.

Also enclosed are five (5) spiral bound copies. Would you kindly circulate these spiral bound copies to the Commissioners.

Also, enclosed is a spiral bound copy for the head of the Mass Media Bureau.

Finally, this is to confirm the fact **that** we sent a copy of the filing to iBiquity Digital Corporation, 8865 Stanford Boulevard, Suite 202, Columbia, Maryland 21045, via First Class Mail.

Thank you in advance for your cooperation.

Respectfully yours,

**Leonard R. Kahn**

Encls.

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**Before the**
**Federal Communications Commission**
**Washington, D.C. 20554**

**PETITION TO AMEND A PETITION FOR RULE MAKING**
**and**
**REQUEST FOR NOTICE OF INQUIRY**

**DOCKET NO._____**

**Leonard R. Kahn**
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**New York, New York 10017**

**(212) 983-6765**

**Date: April 3, 2003**

PURPOSE OF AMENDMENT

The purpose of this requested amendment is to propose an improved Hybrid AM Digital Audio Broadcasting (DAB) system, that is fully compatible with the present FCC spectrum allocation plan, is fully compatible with the half a billion AM receivers used by the American Public, and is a system that works twenty four hours per day. Thus, this Compatible AM Digital system, Cam-D™, solves the basic problems presented by the pending Hybrid DAB system which will do great violence to present frequency allocations, degrade the performance of radios (fidelity and noise performance) used by the Public and will so degrade nighttime radio as to deny those living in vast regions of the United States the radio reception they now depend upon. The Commission is urged to use the revised technical evaluating procedures proposed herein to compare the new and old systems.

BACKGROUND

On January 24, 2003 the Petitioner filed the instant original Petition requesting the FCC to:

1. Revise its procedures for evaluating new technology.

2. Using the revised evaluation procedure reinvestigate the technical basis the Commission used to support its MM-99-325 Order, as said Order is believed to be based on flawed engineering information.

The January 24th Petition also requested the Commission to STAY its MM-99-325 Order, in its entirety.

The Petitioner subsequently was requested by individuals who were aware of his Petition to consider the development of a system that would operate at nighttime as it is understood that the present Hybrid DAB proposal has never been successfully demonstrated at night.

These requests led to the Cam-D™ System which is the subject of this Amendment.

FUNCTIONAL DESCRIPTION OF PROPRIETARY Cam-D™ SYSTEM

There are the two basic goals of the pending Hybrid DAB System:
a) Provide 15 kHz fidelity stereo reception, and
b) Provide slow speed data service.

Cam-D™ accomplishes these goals without violating the Rules that limit occupied bandwidth to essentially ± 10 kHz.

The CAM-D™ System has the following characteristics/advantages:

1. It occupies a bandwidth limited to ± 10 kHz and therefore it will not increase interference to even first adjacent channel stations and it will also not increase co-channel interference.

2. It will produce excellent stereo performance *24* hours per day.

3. It is fully compatible with the more than half a billion radios used by the American Public.

4. It uses digital technology to restore AM fidelity to 15 kHz.

5. It provides a slow-speed digital data stream.

In other words, all of the purported advantages of Hybrid DAB, Items *4* and 5, are provided by a FULLY COMPATIBLE system, compatible with the existing radios, without a dramatic further loss of fidelity, compatible with FCC spectrum rules and, compatible with the requirement that the Public demands for all broadcast service, that it will be available *24* hours every day.

How the above advantages are achieved:

The Cam-D™ proprietary system is based upon a number of patented techniques starting with the KCI Sideband AM Stereo System. This system ensures reliable reception in the face of phase perturbations which are especially serious during nighttime hours.

Thus, in contrast to the Hybrid DAB system that is presently under study by the FCC, Cam-D™ starts with a good quality stereo wave that most people, certainly those who cannot hear very high frequencies, will find difficult to distinguish with the original recordings.

On-the-other-hand, the Petitioner maintains that it will be obvious to the FCC. and any panel of impartial expert engineers advising it, that use of a low fidelity monophonic backup for a high fidelity, stereo signal will never be accepted by the public. especially if they have spent significant amounts of money in purchasing such receivers.

PRELIMINARY SPECIFICATIONS FOR HYBRID
Cam-D™ DIGITAL AUDIO BROADCASTING SYSTEM'

Basic Philosophy Used in Selecting
Specifications and Design of Cam-D™ System

Radio engineering has been called the science of compromise and that compromise was continually driven by the fact that spectrum is a most valuable limited resource. Indeed. the greatest challenge of AM radio has always been how best to serve the Public with a tiny portion of the electromagnetic spectrum, just 1 mHz, 5% of the bandwidth of the FM band and a small percentage of the occupied bandwidth of a **single** television station.

Accordingly, in the case of Cam-D"', or any other Hybrid DAB AM system, the main challenge is to fit the signal into a **20** kHz bandwidth. Clearly, the developers of the pending DAB system have given up trying to satisfy this goal and that System creates totally unacceptable interference, even in a **30** kHz band that obviously dooms operation with first adjacent channel stations and even interferes with weak second and third adjacent channel stations.

To satisfy this severe spectrum requirement, was, and is, a significant challenge and as a first step in satisfying that challenge a fundamental rule has been applied in the development of the Cam-D™ System. The rule used is that in no case will the Cam-D™ System trade bandwidth for any performance characteristic that cannot be heard by an individual with good hearing. In other words, we are not going to pay the price in terms of spectrum for any "improvement" that the public cannot hear.

As a glaring example of violations of this principle in the pending AM DAB system, consider a 60 db stereo separation specification whereas no one can hear in the car, or in the home, or even with earphones, more than 25 to **30** db of stereo separation.

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'As is true of the specifications submitted by proponents of the pending AM DAB system, Cam-D"' specifications are PRELIMINARY AND SUBJECT TO CHANGE. However, it is believed that even though the Cam-D™ system has had no initial on-the-air tests the core signal, as well as the Digital Data transmission concept has actually been successfuly tested on-the-air, day and night, whereas the pending DAB system has never been satisfactorily tested at night. Actually. tests at night of the pending system have resulted in negative results indicating that the system is not viable for nighttime operation. Accordingly, even at this early stage of the development of the Cam-D"' System, it may be fair to state that it is further along in its development than the pending AM DAB System.

As another example of a characteristic that we will not over-specify, consider the use of 16 bit digitalization which provides 96 db of signal-to-quantization noise, whereas recording studios normally do not provide better than 60 db of acoustical signal-to-noise, nor do cars and living rooms provide greater than 35 to 40 db signal-to-noise ratio. The Cam-D''' system will therefore use 8 bit analog to digital conversion, dramatically reducing spectrum requirements (or, conversely, the gain can be traded for increased coverage by avoiding the use of high order modulation.)

Description of The Cam-D''' AM Digital Audio Broadcasting System

The two basic advantages of Digital Audio AM broadcasting that justifies its introduction are:

1) Restoring the fidelity of AM radio to its 15 kHz stereo fidelity, and

2) Providing digital data stream sufficient to support station identification announcements, description of music being played, and a Text-Based Data Stream suitable for news backup and, most importantly, for emergency security and weather reports. Both of these characteristics must be available 24 hours a day and during the national emergency the data stream must be available throughout the host stations' entire normal coverage.

Methods for Accomplishing Maior Goals

The "core" stereo signal that guarantees that Cam-D''' signals will provide an acceptable signal over the entire coverage range of the' Host station, is an update of the Sideband AM Stereo System developed by Kahn Communications, Inc.

This system, as proven by years of full time operating experience by some of the most prestigious stations in the United States and elsewhere, will provide full coverage AM Stereo to 8 kHz. Audio enhancement components from 8 to 15 kHz will be transmitted digitally within the allocated 20 kHz bandwidth of the station. There are two methods of handling the additional frequency range, one which is favored at this stage of the development has been called the "mixed-highs" system which has a parallel in color television transmission. It is believed, from numerous tests by Kahn Communications and various major broadcasters throughout the United States and elsewhere, that it is not necessary to transmit high audio frequencies as stereo signals, but merely as the L+R stereo sum signal ignoring the L-R component. By using the mixed-highs technique, we can reduce the

bandwidth required or we can reduce the required signal-to-noise ratio and increase coverage. Accordingly, if field and laboratory tests convinced the Commission that the use of mixed-highs provides performance indistinguishable from "normal" stereo, the Cam-D'" System will implement the mixed highs version of the system.

Thus, Kahn Communications, Inc. (KCI) plans to provide equipment that can be switched for comparison purposes between conventional, full separation (at least 30 db) stereo, and mixed-highs operation above 8 kHz.

The spectrum to be used for these components, as shown on Fig. 1, is approximately from 8 to 10 kHz below the carrier and 8 to 10 kHz above the carrier. Fig. 2 is a block diagram showing how this Digital improved fidelity is accomplished. Please note that KCI presently plans to use a frequency compression ratio of 50/1, whereas the pending AM DAB System is reportedly using a compression ratio of 70/1.

Also shown on Fig. 1 is a slow speed data signal. The system shown uses a Direct Sequence Spread Spectrum System wherein the Spread Spectrum (SS) waves are confined to the 20 kHz assigned bandwidth and are set to a peak level of 5% L+R modulation. The amplitude of this SS signal is a function of the L+R stereo wave so that when the signal is fully modulated; up to 125% positive, the SS signal is at 5% modulation and the stereo wave masks the spread spectrum wave so that listeners do not hear the data signal.

As the L+R modulation decreases so does the level of the SS wave in order to maintain effective masking. Accordingly, the data runs at its peak speed during full modulation conditions, which is the situation that prevails for much of the time for normal heavily processed broadcast signals.

This basic concept has been used in equipment demonstrated by KCI at Radio Station KSL; however, that demonstration did not use Digital Spread Spectrum technology.

In order for the data signal to be protected from interference from the AM stereo signal, each Spread Spectrum wave handles data that does not transmit more than 20 Bits/sec providing a spread spectrum gain of 1,000 to 1 in power or 30 db. Accordingly, since its 5% modulation is actually approximately 2 db better than 26 db there is almost a 6 db margin which is sufficient to protect the Spread Spectrum data, especially if forward error correction is provided.

The Spread Spectrum Signal components are controlled by the L+R envelope modulation, as shown in Fig. 2, so as to insure that the SS data signal is properly masked. Also, the block diagram shows that the Clock controlling the output rate of the Storage block is also a function of the envelope L+R modulation to minimize

error count. Thus, for example, at 100% L+R the rate is set to a maximum of 20 bits per second; at 50% L + R, 10 bits per second; and at 1% L+R data would cease being transmitted and the SS signal's amplitude would be reduced to a level below 50 db, approximately the specified noise level.

In order to meet what was published as a minimum specification for the pending DAB AM system of .4 kBits per second, additional SS signals would be utilized. However, since it is believed that for the above stated data application purposes, substantially lower data speeds would suffice, allowing for high SS gain. (It should be noted that in the Global Positioning System (GPS), receiver ICs are now priced so as to make practical very inexpensive receivers that provide 24 SS segments, one for each GPS Satellite. It should also be noted that it is possible to encode the 8 to 15 kHz fidelity expansion wave in Spread Spectrum segments, but with an increase in noise level.)

Additional Goals of Cam-D''' Development

It is clear from the above that the basic goals of providing 15 kHz fidelity and a robust data stream are fully achievable. Furthermore, since the backup analog core signal is a relatively high quality stereo wave, unlike the pending Hybrid DAB System, under poor listening conditions the default service is far superior to present AM operation.

KCI also plans to introduce a number of other features to update AM transmission and reception that will provide improved performance in the face of fading, power line noise, and lightning, etc. Most of these performance improvements will also be provided for listeners using those hundreds of millions of radios presently in the hands of the American public.

"ALL-DIGITAL" Improved Technology

As is obvious from the Petitioner's original Petition, the undersigned opposes the use of All-Digital AM transmission which would require the public to purchase brand new equipment in order to continue to receive the service that they have depended upon over decades. However, if the Commission finally rules that compatibility is not an essential requirement for all AM systems, and an All-Digital System is authorized, it will then be in the best interests of the Broadcasters and the Public they serve, that attempts be made to at least minimize the interference of such All-Digital signals.

Accordingly, the Petitioner will propose an All-Digital version of the Cam-D''' concept which will minimize interference to hybrid DAB stations as well as conventional AM stations.

INITIAL TEST STATIONS

The following stations, listed alphabetically, have agreed to act as Test Stations under FCC Experimental Authorization to demonstrate and test the Hybrid Compatible AM Digital Audio Broadcasting System (Cam-D'"):

KKDS, Salt Lake City, Utah, 1060 kHz, 10 kw-D, 149 w-N
KRCM, Beaumont, Texas, 1380 kHz, 1 kw-D, 127 W-N
KRVN, Lexington, Nebraska, 880 kHz, 50 kw, DAN
WDVM, Eau Clare, Wisconsin, 1050 kHz, 500 W-D, 1 kw N**
WJFC. Jefferson City, Tennessee, 1480 kHz, 500 W-D
WJOK, Kaukauna, Wisconsin, 1050 kHz, 1 kw-D, 500-N, DA-2**
WLQV, Detroit, Michigan, 1500 kHz, 50 kw-D 5 kw-N DA-2 (9 Towers)*
WLYV, Ft. Wayne, Indiana, 1450 kHz, 1 kw-U*
WSDS, Ann Arbor, Michigan, 1480 kHz, 750W-D, 5 kw-N DA-2

It should be noted that it was a practical impossibility for the undersigned to negotiate terms of such arrangements with more than a small group of stations. We expect that a number of additional stations to agree to act as Test Stations in the next few months and as such stations commit the undersigned will update his submission to the FCC. It should be further noted that certain major stations that have expressed a strong desire to participate in Cam-D'" tests are owned by major groups that have an ownership interest in the competing DAB System.

'WLQV and WLYV are owned by the same broadcast group. It should be noted that all of the above stations, with the exception of WSDS, have group ownership and have options to purchase additional Cam-D'" units.

**WDVM and WJOK are co-channel stations in the same state and are owned by the same broadcast group. Therefore, these stations will provide an unusual opportunity to evaluate the co-channel properties of the Cam-D System.

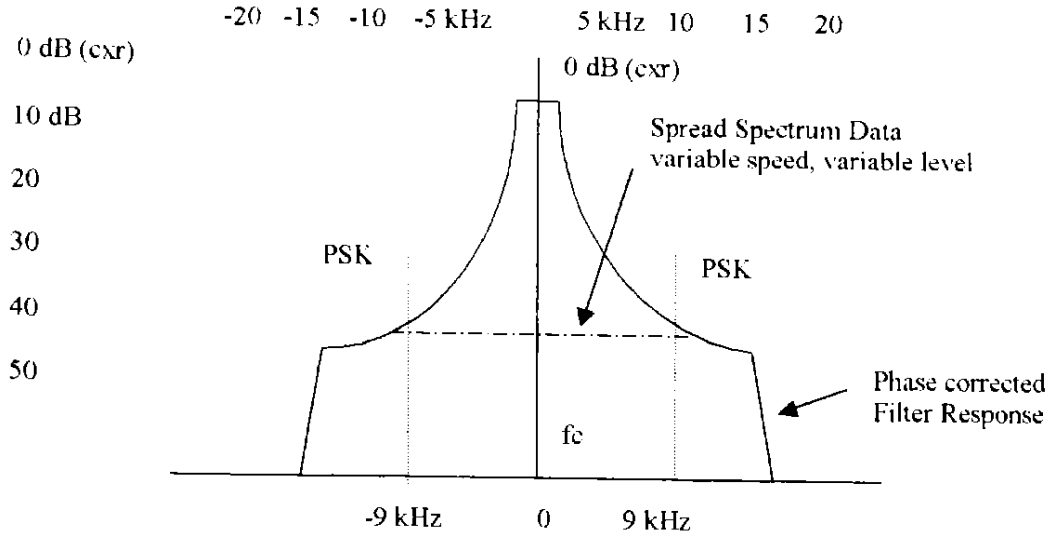
CONCLUSION

The Petitioner respectfully requests the Commission to Amend this Petition as requested above.

Respectfully submitted,

Leonard R. Kahn, PE, FIEEE

cc: iBiquity Digital Corporation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10 dB
20
30
40
50
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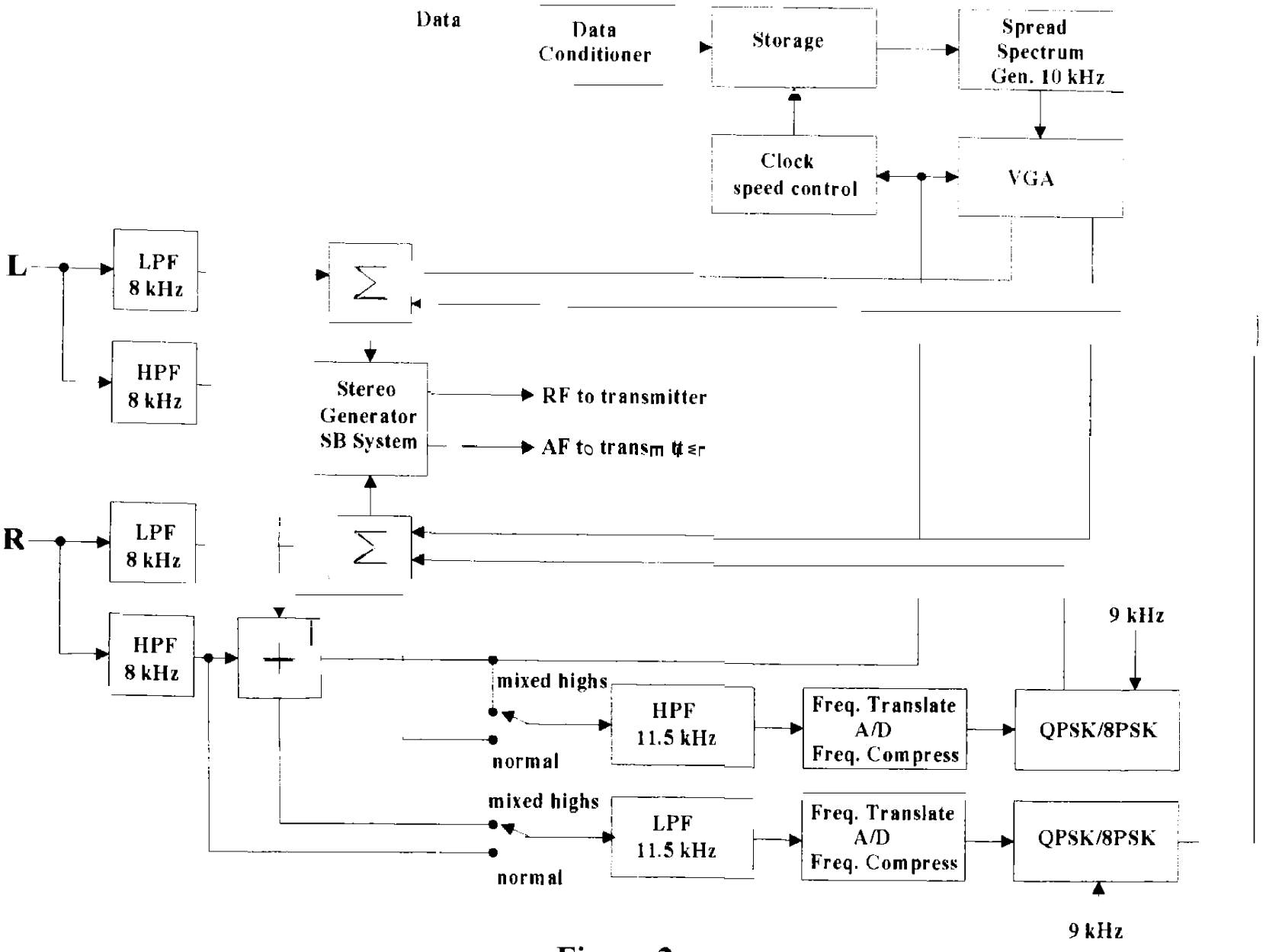
PSK
Phase corrected
Filter Response
fc
-9 kHz
0
9 kHz

Figure 1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Data Conditioner
Storage
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Clock speed control
VGA
L
LPF 8 kHz
HPF 8 kHz
Stereo Generator SB System
RF to transmitter
AF to transmitter
R
LPF 8 kHz
HPF 8 kHz
9 kHz
mixed highs
normal
HPF 11.5 kHz
Freq. Translate A/D Freq. Compress
QPSK/8PSK
mixed highs
normal
LPF 11.5 kHz
Freq. Translate A/D Freq. Compress
QPSK/8PSK
9 kHz

**Figure 2**